## REMARKS

Reconsideration of this application, based on this amendment and these following remarks, is respectfully requested.

Claims 1, 4, 5, 7, 10, 11, and 13 through 15 are now in this case. Claims 1, 4, 5, 7, 10, 11, and 13 are amended. Claims 3, 6, 8, 9, and 12 are newly canceled in this paper; claim 2 was previously canceled. Claim 15 is added.

Claims 1 and 8 were rejected under §103 as unpatentable over the Morishige et al. reference[1] in view of the Matero reference[2]. Regarding claim 1, the Examiner asserted that the Morishige et al. reference teaches all of the elements of the claim, except for mixers receiving a first local oscillator signal that has a frequency equal to the center frequency of the transmitter section or a sub-harmonic thereof. The Examiner further asserted that the Matero reference provides such teachings,[3] and that it would have been obvious to combine these teachings to reduce interference in the radio.

Claims 3 through 7 and 9 through 14 were rejected under §103 as unpatentable over the Morishige et al. and Matero references, further in view of the Tolson et al. reference[4]. The Examiner asserted that the teachings regarding high pass filters from the Tolson et al. reference meet the additional limitations provided by these claims, and also to the first and second adders of claim 7.

To advance the prosecution of this case, claim 1 is amended to now include the limitations previously presented in claims 3 and 6; claims 3 and 6 are canceled accordingly, and

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[1] U.S. Patent No. 6,600,911 B1, issued July 29, 2003 to Morishige et al.
[2] U.S. Patent No. 6,215,988 B1, issued April 10, 2001 to Matero, on an application filed May 27, 1999, which is a continuation of an application filed May 15, 1997.
[3] Office Action of October 24, 2006, page 3, *citing* column 8, lines 17 through 22 (*i.e.,* its claim 1).
[4] U.S. Patent No. 6,625,436 B1, issued September 23, 2003 to Tolson et al. from an application filed July 28, 2000, which in turn claims priority, as a continuation-in-part, to a U.S. application filed October 7, 1999, and to a British application filed October 8, 1998.

claims 4, 5, 7, and 13 are amended for consistency with the amendment to claim 1. Claim 1 is also amended for clarity.

As such, amended claim 1 now recites the first and second high pass filters coupled to the output of the first and second mixers of the receiver section of the claimed radio, and now also recites the first and second sets of two mixers coupled to the output of the first and second high-pass filters, all as previously claimed in claims 3 and 6. As such, no new matter is presented by this amendment to claim 1.

The FDD radio of amended claim 1 provides important advantages over conventional transceivers, including the ability to eliminate costly external surface acoustic wave filters, and also in reducing the dynamic range required of the circuitry in the receiver.[5]

Applicant submits that amended claim 1 is patentably distinct over the applied references. In this regard, Applicant agrees with the Examiner that the Morishige et al. reference fails to teach mixers, in a receiver, receiving a local oscillator signal that is at a center frequency of the transmitter in the same radio or receiver, or a subharmonic thereof.

But Applicant disagrees with the Examiner's assertion regarding the Matero reference. Indeed, Applicant submits that the cited portion of the Matero reference does not teach what the Examiner says that it teaches. The cited portion of the Matero reference reads:

> a modulator that modulates said local oscillator RF signal in accordance with information to be transmitted and that outputs a modulated RF signal, wherein when operating in said first frequency band said local oscillator RF signal has a frequency that is equal to said transmitted RF signal[6]

This passage of the reference makes no mention of a mixer or other circuit on the receiver side of its transceiver, much less teach the application of a local oscillator signal to such a mixer, at a frequency equal to the transmit band center frequency or a sub-harmonic thereof, as claimed. Rather, the modulator of the Matero reference is solely and completely on the transmit side of

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[5] Specification of S.N. 09/785,759, as published as U.S. Patent Application Publication No. US 2002/0004372 A1, paragraphs [0008], [0010], and [0015].
[6] Matero, *supra,* column 8, lines 17 through 22.

the disclosed transceiver, and has the stated function of producing the signal that is transmitted from that transmit side of the transceiver.[7] Accordingly, this cited passage of the Matero reference does not support the assertion made by the Examiner.[8]

Furthermore, Applicant submits that the Examiner has not established the Tolson et al. reference as prior art against the claims in this case.

This application claims priority to a provisional application[9] filed July 3, 2000. Applicant submits that the claims in this application are clearly supported by that provisional application, as evident from pages 4 and 5 of that provisional application[10]. As such, Applicant submits that the claims in this application are entitled to the effective filing date of July 3, 2000, which predates the filing date of the application that issued as the Tolson et al. reference.[11]

The Examiner cites to the parent application[12] of the Tolson et al. reference,[13] which has an earlier filing date than that to which this application is entitled. However, the Examiner can only carry back the filing date of the Tolson et al. U.S. Patent, which issued as a continuation-in-part application of the earlier parent application, if the Tolson et al. U.S. Patent has the right to priority to that parent application. This requires a determination that the claims of the Tolson et al. U.S. Patent are supported by the parent application. As is so clearly stated by the MPEP:

> In order to carry back the 35 U.S.C. 102(e) critical date of the U.S. patent reference to the filing date of a parent application, the **>U.S. patent reference< must * have a right of priority to the earlier date under 35 U.S.C. 120 or 365(c) and *>the parent application must< support the invention claimed as required by 35 U.S.C. 112, first paragraph. "For if a patent could not theoretically have issued the day the application was filed, it is not entitled to be used against another as

[7] Matero, *supra,* column 5, lines 31 through 34 ("The output of the modulator 44 is supplied to a first transmitter amplifier 62, to an (optional) 890 – 915 MHz transmit filter 64, and to a final power amplifier 66.").
[8] Office Action, *supra*, page 3, lines 1 through 3.
[9] Appl. No. 60/215,711.
[10] Which the undersigned believes to be the copies of pages from Applicant's engineering notebook.
[11] *I.e.,* U.S. Appl. S.N. 09/628,951, filed July 28, 2000.
[12] Office Action, *supra,* page 4 ("US Patent App. 09/413,725").
[13] And the Examiner cites to pages of that parent application.

'secret prior art'" under 35 U.S.C. 102(e). *In re Wertheim*, 646 F.2d 527, 537, 209 USPQ 554, 564 (CCPA 1981).[14]

No such finding in this regard has been presented by the Examiner. Indeed, it is conceivable that this parent application (now abandoned) may have been rejected because the claims lacked support in the specification of that parent application, requiring Tolson et al. to file the continuation-in-part necessary for such support.[15] Rather, the Examiner has asserted no reason or basis why the Tolson et al. patent is entitled to the earlier filing date of its parent application. Applicant therefore respectfully submits that the Examiner has failed to carry his necessary burden of establishing that the Tolson et al. teachings are *prior art* to the claims in this case.

For these reasons, Applicant submits that the rejection of claim 1 and its dependent claims is in error. Withdrawal of the rejection is requested.

Applicant further respectfully submits that amended claim 1 and its dependent claims are patentably distinct over the applied references, because there is no suggestion from the prior art to combine the teachings of these references in such a manner as to reach the claims.

As noted above, the Examiner asserted that the Morishige et al. reference fails to disclose a mixer or mixers that receive a local oscillator signal at the transmit center frequency or a subharmonic thereof. While this is in fact true, Applicant submits that the Morishige et al. reference falls further short of the radio of claim 1 and its dependent claims, because it does not teach the combination of the down conversion section, the high pass filters, and the first and second sets of mixers now required by amended claim 1. As stated in the Morishige et al. reference itself, its superheterodyne receiver includes bandpass filter 3, which filters the RF signal amplified by low noise amplifier 2.[16] As such, bandpass filter 3 of the Morishige et al. reference is an RF bandpass filter, because the signals it filters have not yet been converted to baseband, or even to the intermediate frequency after a down-conversion. Rather, these signals remain at their received high frequencies. As known in the art, RF bandpass filters must be

[14] MPEP §2136.03(III).
[15] The file history of the Tolson et al. U.S. Patent, and that of its parent application, are not available via Public PAIR as of today.
[16] Morishige et al., *supra,* column 1, lines 23 through 52; column 6, lines 33 through 42.

external devices, and are typically expensive filters such as surface acoustical wave (SAW) filters.[17]

Applicant discovered that a primary source of interference in FDD transceivers, such as those described in the Morishige et al. reference, is the transmit side of the transceiver in which the receiver is implemented.[18] Based on this realization, Applicant further discovered that the mixing of the incoming RF signal with a local oscillator frequency at the center frequency of the transmit band or a subharmonic thereof would reduce this primary source of interference to at or near DC, allowing a simple high-pass filter, which may be integrated into the same integrated circuit as the receiver, to eliminate this interference.[19] The resulting information signal can then be processed into the in-phase and quadrature-phase baseband signals by the downstream sets of mixers.[20] And the RF bandpass filter becomes no longer necessary. This invention is expressed in amended claim 1 by the requirement of the receiver section including a down conversion section comprising first and second mixers, followed by the first and second high pass filters, and the first and second sets of mixers, as recited.

Accordingly, Applicant submits that the patentability of claim 1 depends upon whether it is obvious to substitute mixers receiving a local oscillator signal having a frequency equal to the transmit band center frequency or a sub-harmonic thereof, and high pass filters, for the band pass filter 3 of the Morishige et al. reference. Applicant submits that it is not obvious to make this substitution, especially using the Matero reference or the Tolson et al. reference[21].

The Matero reference provides no such suggestion to make this substitution, because its disclosed transceivers also utilize RF bandpass filters in exactly the same manner as the Morishige et al. reference. Attention is directed, in this regard, to RX band pass filter 42 of the Matero reference[22]. This band pass filter 42 is clearly and explicitly recited as filtering signals at RF frequencies, whether of the RF signal as received (in the GSM and DAMPS bands, for

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[17] Specification, *supra,* paragraphs [0010] and [0015].
[18] Specification, *supra,* paragraphs [0008], [0012], [0013], [0015].
[19] Specification, *supra,* paragraphs [0011], [0013].
[20] Specification, *supra,* paragraphs [0014].
[21] If available as prior art, which for the reasons discussed above, Applicant does not admit.

Figures 3 and 4, respectively), or after downconversion to one-half of the higher DCS frequencies in the DCS bands.[23] The Matero reference therefore provides no suggestion to modify the teachings of the Morishige et al. reference in the manner necessary to reach amended claim 1.

Nor does the Tolson et al. reference provide such teaching or suggestion, even if available as prior art.[24] The lack of such suggestion by the Tolson et al. reference is evident from the complete lack of any mention that the frequency of any of the receive local oscillator is at a transmit band center frequency, especially considering that the Tolson et al. reference is directed solely to *receivers*, and completely and utterly fails to disclose any transmitter whatsoever. Furthermore, the high-pass filters 10, 11 disclosed by the Tolson et al. reference do not filter the received signal in its signal path, but rather are used in a feedback loop.

Accordingly, Applicant respectfully submits that there is no suggestion from the prior art to modify the teachings of the Morishige et al. reference, nor to combine the teachings of these references in any other manner, to provide the radio of amended claim 1, in which a receiver includes a down conversion section with first and second mixers, each receiving a local oscillator signal having a frequency equal to the transmit band center frequency of a transmitter section in the same radio, or a sub-harmonic thereof, in combination with high-pass filters coupled to the output of those mixers, and first and second sets of mixers receiving the output of the respective high-pass filters, as claimed. Furthermore, the non-obviousness of this claimed radio is especially evident considering the discovery, by Applicant, that the transmitter section of the radio is the primary source of interference, and that this combination of mixers and high-pass filters are sufficient to eliminate this interference, and permit integration of the radio into an integrated circuit without requiring expensive external RF filters, as enabled by the invention of amended claim 1.

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[22] Matero, *supra,* column 5, line 18 through column 6, line 23.
[23] Matero, *supra,* column 5, line 18 through column 6, line 23. *See* column 6, lines 12 and 13 (". . . the RX band filter 42 is an 869 – 894 MHz filter . . .").
[24] Which Applicant does not admit that it is.

Applicant therefore respectfully submits that amended claim 1 and its dependent claims are patentably distinct over the prior art of record in this case.

Also to advance the prosecution of this case, independent claim 8, and its dependent claims 9 and 12 are canceled. Claims 10 and 11 are amended to depend on independent claim 14, and claim 15 is added to more completely cover all aspects of Applicant's invention. No new matter is presented.

As mentioned above, claims 9 through 14 were rejected under §103 as unpatentable over the Morishige et al. and Matero references, further in view of the Tolson et al. reference. Applicant traverses the rejection of claim 14, and asserts that it and its dependent claims now in this case are patentably distinct over these references.

As discussed above relative to claim 1, Applicant first submits that the Examiner's citation of the Matero reference, as teaching the mixing of a receive signal with a local oscillator frequency equal to the transmit center frequency or a sub-harmonic thereof, is in error and does not support the rejection. The cited portion of the Matero reference reads:

> a modulator that modulates said local oscillator RF signal in accordance with information to be transmitted and that outputs a modulated RF signal, wherein when operating in said first frequency band said local oscillator RF signal has a frequency that is equal to said transmitted RF signal[25]

As discussed above, this passage of the reference is directed solely to functionality on the transmit side of a transceiver. In its very words, this passage states that the modulator modulates a local oscillator RF signal with information to be transmitted, with the local oscillator RF signal equal to the transmitted RF signal. Nowhere does this passage mention the mixing of a *receive* signal with such a local oscillator frequency, much less in combination with high-pass filtering the resulting down-converted receive signal and converting that filtered signal to base-band. Nor does the Examiner assert that any other portion of the Matero reference provides such teachings. For this reason, Applicant submits that this cited passage of the Matero reference does not

[25] Matero, *supra,* column 8, lines 17 through 22.

support the assertion made by the Examiner,[26] and that the rejection of claim 14 is therefore in error.

Furthermore, also as discussed above, Applicant submits that the Examiner has not established that the Tolson et al. reference is prior art against the claims in this case. As discussed above, Applicant submits that this application properly claims priority to its provisional application[27] filed July 3, 2000, and that this provisional application supports claim 14 and its dependent claims. The Examiner cites to the parent application of the Tolson et al. U.S. Patent, presumably because the Tolson et al. U.S. Patent does not itself have a filing date which is earlier than the effective filing date than that to which this application is entitled. However, the parent application of the Tolson et al. U.S. Patent is prior art if and only if that parent application supports at least one claim in the Tolson et al. U.S. Patent. This is not necessarily the case here, because the Tolson et al. U.S. Patent issued as a continuation-in-part application of that parent application. As such, a determination that claims of the Tolson et al. U.S. Patent are supported by the parent application is required; the Examiner has provided none. Applicant therefore respectfully submits that the Examiner has failed to carry his necessary burden of establishing that it is *prior art* to the claims in this case that render the claims unpatentable under §103.

For these reasons, Applicant submits that the rejection of claim 14 and its dependent claims is in error, and withdrawal of that rejection is requested.

Alternatively, Applicant submits that claim 14 and its dependent claims are patentably distinct over all of the applied references, even considering the Tolson et al. reference as prior art.[28] Specifically, Applicant submits that there is no suggestion from the prior art to combine these references in such a manner as to reach claim 14.

Applicant agrees with the Examiner that the Morishige et al. reference fails to disclose mixing a receive signal with a local oscillator frequency that is equal to the transmit center

[26] Office Action, *supra*, page 7.
[27] Appl. No. 60/215,711.

frequency of an interfering transmitter, or a subharmonic thereof. However, Applicant submits that the Morishige et al. reference lacks teachings regarding other steps in the method of claim 14. Specifically, the Morishige et al. reference itself lacks any mixing of a receive signal, in combination with converting of that mixed (and later filtered) signal to base-band. Rather, the Morishige et al. reference teaches a superheterodyne receiver in which a bandpass filter 3 filters a received RF signal, after amplification by low noise amplifier 2.[29] As discussed above, such RF bandpass filters are necessarily external devices to receiver integrated circuits, and are typically quite expensive (*e.g.,* implemented as a surface acoustical wave (SAW) filter[30]). According to the Morishige et al. reference, converting of the signal to baseband is then performed by its mixers 4.[31]

However, Applicant discovered that a primary source of interference in FDD transceivers, such as those described in the Morishige et al. reference, is the transmit side of the transceiver in which the receiver is implemented.[32] This discovery led Applicant to the further discovery that the RF bandpass filter could be replaced by the mixing of the incoming RF signal with a local oscillator frequency at the center frequency of the transmit band or a subharmonic thereof, so that the interference would be down-converted to DC, and a simple high-pass filter to eliminate the resulting down-converted interference.[33] The resulting information signal from this mixer and high-pass filter can then be converted into the in-phase and quadrature-phase baseband signals, by downstream mixers.[34]

Accordingly, Applicant submits that claim 14 is unpatentable only if is obvious to substitute the mixing of the receive signal with a local oscillator signal having a frequency equal to the transmit band center frequency or a sub-harmonic thereof and then high pass filtering the down-converted receive signal, for the band pass filtering applied by filter 3 of the Morishige et

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[28] Which Applicant does not admit.
[29] Morishige et al., *supra,* column 1, lines 23 through 52; column 6, lines 33 through 42.
[30] Specification, *supra,* paragraphs [0010] and [0015].
[31] Morishige et al., *supra,* column 6, lines 17 through 32.
[32] Specification, *supra,* paragraphs [0008], [0012], [0013], [0015].
[33] Specification, *supra,* paragraphs [0011], [0013].
[34] Specification, *supra,* paragraphs [0014].

al. reference. Applicant submits that it is not obvious to make this substitution, especially from the contents of the Matero reference and the Tolson et al. reference[35].

No such suggestion is provided by the Matero reference, because it also discloses the use of RF bandpass filters, in exactly the same manner as the Morishige et al. reference.[36] And no such suggestion is provided by the Tolson et al. reference, even if available as prior art,[37] considering that it nowhere mentions (nor was asserted as mentioning) that the frequency of any of its receive local oscillators is at a transmit band center frequency (nor even any transmitter). In any event, the high-pass filters 10, 11 disclosed by the Tolson et al. reference also do not perform the high-pass filtering step of claim 14, because it does not teach the subsequent converting of the high-pass filtered signal to base-band, as claimed.

Accordingly, Applicant respectfully submits that there is no suggestion from the prior art to modify the teachings of the Morishige et al. reference, nor to combine the teachings of these references in any other manner, to provide the method of claim 14. Applicant further submits that the non-obviousness of his discovery that the transmitter section of the radio is the primary source of interference, and that the combination of the mixing and high-pass filtering steps can eliminate this interference and permit integration of the radio into an integrated circuit without requiring expensive external RF filters, further indicate the patentability of these claims.

Applicant therefore respectfully traverses the rejection of claim 14, and submits that claim 14 and its dependent claims are patentably distinct over the prior art of record in this case.

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[35] If available as prior art, which for the reasons discussed above, Applicant does not admit.
[36] Matero, *supra,* column 5, line 18 through column 6, line 23.
[37] Which Applicant does not admit that it is.

For these reasons, Applicant respectfully submits that all claims now in this case are in condition for allowance. Reconsideration of this application is therefore respectfully requested.

Respectfully submitted,
/Rodney M. Anderson/
Rodney M. Anderson
Registry No. 31,939
Attorney for Applicant

Anderson, Levine & Lintel, L.L.P.
14785 Preston Road, Suite 650
Dallas, Texas 75254
(972) 664-9554